Quality Assurance Guidelines
For Projects in
Texas State Agencies

Process for Project Monitoring and Control

V 1.0 Initial Release
2/1/00

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1. PURPOSE OF THE PROCESS

The Project Monitoring and Controlling Process is used by project managers and project teams to ensure the team is making satisfactory progress to the project goals. The purpose is to track all major project variables – cost, time, scope, and quality of deliverables. The overall objectives of the process are to[1]:

- Track and review actual project accomplishments and results to project plans
- Revise the project plan to reflect accomplishments thus far, and to revise the plan for remaining work, if needed
- Provide visibility into progress as the project proceeds, so that the team and management can take corrective action early when project performance varies significantly from original plans

Deliverables from monitoring and controlling include

- written status reports
- updates to lists of action items, risks, problems, and issues
- updates to the plan and schedule, to reflect actual progress
- comparisons of actual costs to budgeted costs, as well as the cost/benefit analysis used when starting the project
- audit and review reports of the activities and work products under development

2. SCOPE OF THE PROCESS

The monitoring and controlling processes are based on the plan, thus the tailoring for monitoring and controlling is much like the tailoring for planning. For many medium and large projects, the plan is likely to undergo change, to reflect the resolution of items that were unknown or that have changed since the start of the project. For further guidance on tailoring a process based on project characteristics, see *Tailoring the Guidelines* elsewhere in this manual.

[1] See also *Process for Analyzing and Managing Risk*, and *Process for Post-Project Reviews* for discussions of risk monitoring and capturing of project best practices and lessons learned.

2.1 ACTIVITIES TAILORING

Monitoring and controlling activities vary for different types of projects, in the same way that planning the project varies by type of project.

Activities	Low QA Focus	Medium QA Focus	High QA Focus
Continuously Monitor Progress	Use the project summary as the basis for monitoring and control	Project manager uses project plan as basis for monitoring; each team member provides weekly report of progress to the project manager or a team leader	Project manager uses project plan as basis for monitoring; each team member provides weekly report of progress to the project manager or a team leader
Conduct Team Reviews	May be done with email or informal sessions	Likely to need a weekly coordination meeting to review status of the work, risks, measures, and action items being handled	May be several sub-teams which regularly get together to review progress, as well as an overall regular team meeting and regular reports
Conduct Formal Progress Reviews	May be done with email or informal sessions	Likely to be done on a monthly basis with senior management and key stakeholders	Likely to be done on a monthly basis with senior management and key stakeholders
Manage Changes	May involve only one or two people	Likely to include representatives of project, customer, management, QA, CM	Likely to include representatives of project, customer, management, QA, CM
Revise the Plan	May be informal agreement with management	Significant changes need to be reviewed and agreed to by those who originally approved the plan	Significant changes need to be reviewed and agreed to by those who originally approved the plan
Conduct Work Product Reviews	Likely to be informal walkthroughs with two or three people	Some may be walkthroughs, some technical reviews and inspections	Likely to have both technical reviews and inspections, based on quality goals

2.2 ROLES TAILORING

Role	Low QA Focus	Medium QA Focus	High QA Focus
Project Manager	Person in this role is also likely to be a member of the team doing the work	Person in this role may also do some of the work of the team	Person in this role is dedicated to project management
Configura-tion Management	Role may be performed by project manager or a member of the team	Role may be performed by someone on the project team or someone from an independent group	Role likely to be performed by someone from an independent group
Change Control Board	May be done by the project manager and one or two others	Likely to be small group – project manager, senior manager, QA, user representative	Formally chartered group composed of representatives from all major stakeholders

2.3 DELIVERABLES TAILORING

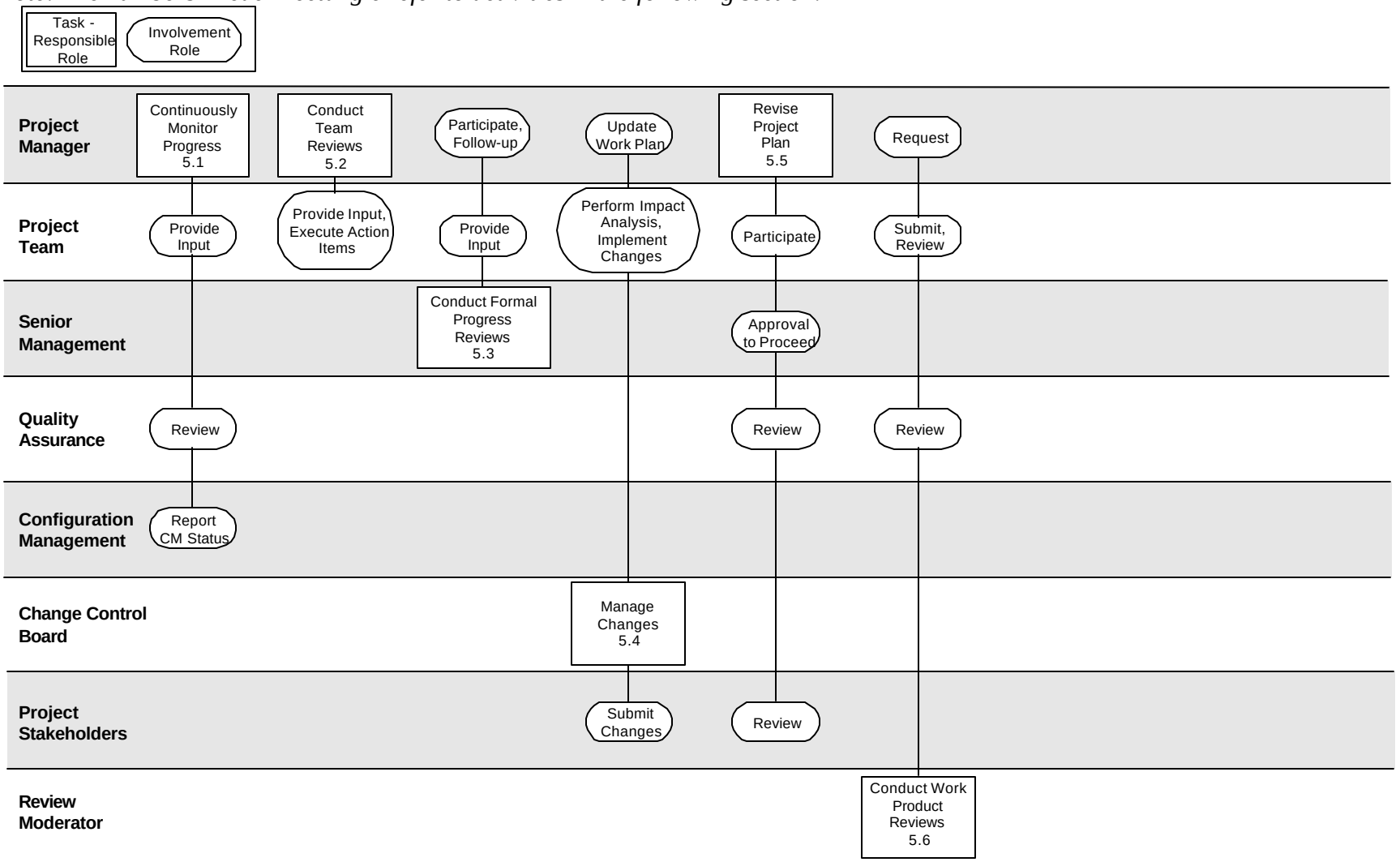
Activity Deliverable	Low QA Focus	Medium QA Focus	High QA Focus
Project status reports	Email or verbal reports	Meetings, email, possibly hardcopy at major milestones	Meetings, email, regular hard copy, filed in project notebook
Project performance measurement indicators	Probably confined to schedule and budget	Schedule, budget, size of major deliverables, defect counts	Schedule, budget, size of major deliverables, defect counts plus project issue-driven measures
QA non-compliance reports	Informal discussion with Project Manager	Notes from QA kept in project notebook	Formal reports to standard distribution
CM activity/ status reports	Notes from CM	Activity logs kept in project notebook	Formal reports to standard distribution
Revised work products	Notes added as attachment to original documents	Revisions made to major deliverables	Revisions tracked through traceability tool

3. ROLES IN THE PROCESS

Role Names	Role Definitions
Project Manager	• Responsible for planning and tracking the project, including approved revisions to project plans, estimates, schedules and budgets
Project Team	• Participates in building and reviewing the plan and project work items; develops or implements the deliverables
Senior Management (including Steering Committee)	• Authorizes the project and provides personnel and other resources • Reviews progress and approves any changes to plans to ensure the project meets organization goals
Quality Assurance	• Reviews processes used in performing the project, to ensure they comply with the project plan and organization standards and processes • Reviews deliverables of the project, to ensure they meet customer requirements, quality requirements, project plans, and organization standards
Configuration Management	• Identifies (or reviews work done by the team to identify) the configuration items to be handled with configuration management, places the items under control, creates baselines, makes authorized changes to the configurations, provides status reports, and builds releases of the product
Change Control Board	• Reviews requests for changes to project baselines (requirements, deliverables completed, work underway), approves or rejects change requests, ensures approved changes are completed as authorized

4. GRAPHICAL OVERVIEW OF THE PROCESS

Note: The numbers in each rectangle refer to activities in the following section.



5. ACTIVITY DESCRIPTIONS

The following sections provide details on each activity: a description of the purpose, entry and exit criteria, and the sequence of tasks to be done. Tasks are shown along with the roles generally responsible and/or involved in those tasks, and the deliverables produced by the task. These activities are not sequential – each is used as needed. Some activities are driven by dates, such as monthly progress reviews, while others are ongoing or they are triggered by events.

5.1 CONTINUOUSLY MONITOR PROGRESS

To be sure that the project stays on track, the project manager and project team continuously monitor their progress to the Project Development Plan.

Purpose: Examine progress on all key dimensions of the project, to determine whether or not project goals are likely to be met, as documented in the Project Development Plan. When a variance is detected, take appropriate corrective action.

Entry Criteria:

- Project plan is documented and approved; work is underway
- Explicit assignments of responsibility for work products and activities have been made
- Project is staffed and other resources are available, particularly the resources and funding required to do project tracking
- The project manager has been trained to perform the appropriate technical and management responsibilities of the project
- Other software management personnel have been oriented to the technical aspects of the project

Roles	Tasks

Project Manager	• Monitor, at least weekly, progress to plan on the key elements
	  • Tasks starting and ending when expected
	  • Deliverables with content and quality level required
	  • Level of effort as planned
	  • Size of software work products as planned
	  • Milestones being met when planned
	  • Costs as budgeted
	  • Critical computer resources as planned
	  • Risk management progress
	  • Issues and action item resolution
	  • Measures to handle key project issues
	• Review and process requests for changes to the plan
	• Initiates and monitors corrective actions when necessary

Project Team	• Review progress on the tasks assigned and level of effort spent

Roles	Tasks
Members	compared to effort planned • Report progress weekly to the remainder of the team and the Project Manager • Monitor for and report potential risks to the project • Enter data for measures associated with project issues
Quality Assurance	• Review project work products and activities, identifying any exceptions to the project plan and/or organization processes • Review measurement data for accuracy and consistency • Discuss deviations with project team and project manager • Raise non-compliance items with management, if not resolved in team
Configuration Management	• Accept items for configuration management as planned, if they meet the conditions set by the project and by organization processes for configuration management • Report on status and content of baselines

Exit Criteria:
- Project is complete or terminated (this activity continues throughout the project)

5.2 CONDUCT TEAM REVIEWS

For most projects that involve a team, it is useful to have regular reviews of progress and status. Teams might gather for regular meetings, or they might exchange information electronically.

Purpose: Communicate status and plan for next activities of the project.

Entry Criteria:
- Project is staffed and underway.

Roles	Tasks
Project Manager	• Determine what kinds of information need to be exchanged • Decide what medium of communication is best – meeting, electronic exchange, other • Determine frequency of communication

Project Manager, Project Team	• Exchange status information (in email, team meeting, other)
	  • Current action items, issues, risks
	  • Status of technical activities
	  • Plans for next activities
	  • Establish action items

Project Manager, Project Team	• Follow up on action items, as appropriate • Work on next assigned tasks

Exit Criteria:
- Project is complete or terminated (this activity continues throughout the project)

5.3 CONDUCT FORMAL PROGRESS REVIEWS

Formal progress reviews are conducted for large projects and for some medium projects, to ensure that all stakeholders are kept informed of project status and progress. These reviews may be at key milestones for a project, or they may be event- or date-driven. Projects often hold monthly or quarterly reviews, in addition to (or instead of) project phase-based milestone reviews.

Purpose: Communicate status of the project to stakeholders and ask for assistance in areas that need management or stakeholder attention.

Entry Criteria:
- Project has reached milestone, event, or date for review

Roles	Tasks
Project Manager	• Identify information that needs to be prepared and/or presented • Identify participants for the review • Establish tasks and assignments for the review • Establish review logistics

Project Manager, Project Team	• Prepare information for the review, including items such as
	  • List of accomplishments in last period
	  • List of plans for next period
	  • Milestone progress reports (planned to actual)
	  • Staffing profile (planned to actual)
	  • Cost Profile (planned to actual)
	  • Size and Critical Computer Resources (if appropriate)
	  • Risk Management Status
	  • Action Item Status
	  • Quality Assurance Status
	  • Configuration Management Status
	  • Requirements Management Status
	  • Updated Cost-Benefit Analysis

Project Manager, Senior Management, Other Stakeholders	• Conduct the review
	  • Present the status information
	  • Identify action items that require attention of management and/or stakeholders
	  • Gain agreement on next steps and action items

Project Manager	• Provide information requested and establish action items

Exit Criteria:
- Review was held and any follow-up information communicated
- Action item list is updated with items from the review

5.4 MANAGE CHANGES

For most projects, there are multiple changes to one or more project parameters once the project has started. This might include changes to requirements, problems[2], or defects in the deliverables, or changes to resource commitments. Each of these can be handled by a change management process external to this process, or by this activity.

Purpose: Identify, evaluate, prioritize, and control changes to the project.

Entry Criteria:
- Project is underway
- Change request has been submitted by a project member or a stakeholder (requirements change, problem, defect, or other)

Roles	Tasks
Interested Party	• Document the change requested, along with priority of the change, (optional) approaches to handle the change, work around if the change is not implemented
Project Manager	• Acknowledge the change applies to this project • Enter change request into tracking system log
Change Control Board	• Review the change request and determine whether or not it is worth evaluating for action
Project Team Member	• Estimate the impact of the change on the project effort, cost, schedule, resources
Change Control Board	• Using the estimate, decide whether or not to authorize the change • If the change is denied, communicate that decision to the requestor and terminate this process
Project Manager	• Incorporate the change into the project work plan and adjust resources and schedule as needed, to accommodate the change
Project Team Member	• Perform the work needed to address the change, and conduct the associated verification activities to ensure correctness • Update change request records to document the changes made, and communicate completion status to the Change Control Board
Change Control Board	• Update the change request records to reflect the completion status and inform the requestor of the final status

Exit Criteria:
- Change has been addressed and requestor has been informed
- Change request records have complete information about the request and the work that was done to address it

[2]A problem is a currently occurring obstacle that prevents the project from accomplishing one or more project objectives.

5.5 REVISE THE PLAN

If there are significant changes in project deliverables, schedule, budget, or approach, the project plan is revised. This is also usually done at the end of each major life cycle phase. Any signoffs that were needed for the initial project plan are needed for a significant change.

Purpose: To revise the project plan (including estimates and schedule) to accommodate significant changes, so that the documented plan reflects the plan in use by the project team.

Entry Criteria:

- Project team and management has agreed to a significant change in the project.

Roles	Tasks

Project Manager	• Determines that a significant change in the plan is needed. Examples of such changes include:
	  • Life cycle approach has changed from one release cycle to a series of iterations, or the number of releases has changed
	  • Time spent in a given project phase or the overall schedule has been changed by more than x% (determined by state or agency guidance)
	  • Requirements have changed in a way that requires additional staffing, more time, or an alternate approach to the work
	  • Tools and methods to be used are different from what was initially planned

Project Manager, Project Team	• Develop updates to project plan, review with all affected parties • Establish commitments to changes in plan
Senior Management, Stakeholders, Quality Assurance	• Review changes to project plan • Approve changes (or negotiate for other changes) • Sign off updated plan
Project Manager	• Puts updated plan under configuration management

Exit Criteria:

- Project plan is updated, approved, and under configuration management
- Changes to commitments have been communicated to all affected parties

5.6 CONDUCT WORK PRODUCT REVIEWS

Throughout the project life cycle, the project team conducts team reviews of the work products being built. The types of reviews may vary, according to the plan set by the project team, to ensure best use of time spent on the review.

Purpose: Ensure all involved understand the content of a given work product, and identify any changes needed in the work product before starting work on other work products that depend on it.

Entry Criteria:
- Author agrees work product is ready for review
- Team is available to review the item
- Review process is defined and understood by the review team

Roles	Tasks

Project Team Member (author)	• Identifies what portions of the work product are to be reviewed
	• Works with Project Manager to set goals for the review and select type of review. Alternatives include:
	  • Informal Walkthrough by several team members
	  • Technical Review by project team members and stakeholders
	  • Inspection by project team members (and perhaps others)
	• Selects a moderator for Technical Review or Inspection

Moderator	• Establishes logistics for Technical Review or Inspection • Holds a kick-off meeting if needed, to distribute materials
Review Team	• Examines work product before attending the review meeting • Documents questions and defects in the work product

Review Team, Moderator (if relevant)	• Participates in the review meeting
	  • Informal Walkthrough – team examines the work product at its own pace, giving feedback to the author
	  • Technical Review – moderator leads the review team through the key issues of interest that were identified for the review
	  • Inspection – moderator leads review team through logging meeting, gathering defects and questions for the author

Author	• Incorporates feedback from the review
Quality Assurance, Project Manager	• Review results of the work product review to ensure goals have been met and organization processes were used (and useful)

Exit Criteria:
- Feedback is incorporated into work product

6. MEASURES

Measures of the project progress, product quality, and process performance include the following:

Milestone Attainment – Monitor achievement of milestones to the initial milestones set in the project plan, reporting variance on each; maintain the initial baseline, as well as the most recent update; report achievement and variance to both

Effort Spent – Track the initial effort estimates for each major element of the work breakdown structure, compared to the actual effort spent performing that element (may be a work product or an activity)

Budget/Cost Performance – Track the rate of spending on the project by period (week or month) compared to the planned spending

Requirements Change – Track requirements change by period (generally month), showing total number of requirements, number added in this period, number deleted in this period, and number changed in this period; also track these dimensions by the amount of effort reflected in each, to understand the impact on the project's time and cost

Measures for monitoring the project monitoring and controlling activities include the following:

Handling of Project Tracking – Use items such as

- Schedule attainment – compare progress review dates to the dates planned
- Effort required – compare the amount of effort used for monitoring and controlling to the plan

7. VERIFICATION ACTIVITIES

During project monitoring and control, the following verification activities are appropriate for management:

- Review periodic reports of the project team and/or project manager, to ensure that the project continues to meet business needs.
- Provide information as needed by the project, and authorize the work to proceed if the project is meeting plans and commitments.
- Participate in formal project reviews, reviewing status and handling action items.
- Review the business case (or cost/benefit analysis, as appropriate) on a regular basis, to ensure that this project should continue.

The following verification activities are appropriate for Quality Assurance:

- Review activities of the project team on an ongoing basis, to verify that they are following their plan and the relevant processes of the organization.
- Review the results of work product reviews and testing, to ensure that the project deliverables meet customer requirements and project quality plans.
- Review change management and configuration management activities, to ensure they follow the organization processes and that baselines are under control.

8. DOCUMENT CONTROL

Revision	Date	Description
0.1	11/13/99	First draft; for internal review
0.2	11/24/99	Author revisions; addition of diagram
0.3	12/8/99	Update diagram, tailoring guidelines, page breaks
1.0	2/1/00	Incorporate Advisory Group revisions

A. ADDITIONAL RESOURCES

Project Planning and Tracking Bibliography

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B. Supporting Templates

Please see the following items, accessible separately:

- **Monthly Project Status Report –** a Word file with a sample monthly status report for a project; includes items for tracking milestone progress, key accomplishments, costs, risks, and action items
- **Sample Progress Review template –** a PowerPoint file with a sample set of presentation slides that can be used for a formal project review; includes slides for showing accomplishments, plans, milestone attainment, staffing profile, requirements management status, issue and problem status, and risk management status
- **Simple tracking templates –** an Excel file with several worksheets for tracking action items, a simple work breakdown structure, and risks

Please also see the supporting templates for risk management and for handling post project reviews.

C. Supporting Checklists

Please see the following checklists, accessible separately:

- **Change Management Checklist –** items to consider for documenting change requests, handling them with a change process, and ensuring approved changes are included in the project deliverables
- **Configuration Management Checklist –** items to consider for planning and performing configuration management
- **Project Monitoring Checklist** – items to consider when checking the work of a project manager and project team in monitoring the project to its plan
- **Project Review Checklist** – items to consider when planning, conducting, and following up on actions after a project review
- **Quality Assurance Checklist** – items to consider for planning and performing quality assurance

Please also see the supporting checklists for risk management and for handling post project reviews.